2015 Fire Weather Annual Report

National Weather Service - Boise

Including:

The Weather

- Seasonal Reviews
- State of the Snowpack

Special Forecasts & Services

- Spot Forecasts
- Red Flag Warnings
- IMET Activity & Dispatches
- Training & Contributions
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SEASONAL REVIEW: WINTER 2014-2015

Winter 2014-2015 can be best described by the well-known idiom, "In like a lion, out like a lamb."

November's roar was most apparent in the Treasure Valley, where a mid-month storm dropped nearly eight inches of snow over Boise proper. This snowfall was preceded by a record-setting rain event early in the month, and was quickly followed by an arctic air mass and several cold, dry "inversion days." Despite a dry ending, November precipitation met or surpassed normal values in Boise, Twin Falls, and McCall; but fell short in Burns, Baker City, and Jerome.

Significant precipitation returned to much of eastern Oregon and southwest Idaho in **December** (excluding the Magic Valley and areas just north of the Nevada border). Temperatures fluctuated in an active and changeable weather pattern; keeping cold highs at bay by limiting the number of stagnant "inversion days." By month's end, all sites had a mean temperature between 7 and 9 degrees above average and Boise had recorded its **second warmest December ever**. (Only December of 1973 was warmer.)

A broad, nearly-stationary upper level ridge set up over the West Coast in **January**, forcing the primary storm track well to our north. Snow levels were, on average, quite high during this time frame, and what little precipitation did occur fell more as rain than snow. Rainfall helped increase mid-winter reservoir storage, but this rain-on-snow was detrimental to the season's snowpack.

This pattern continued into **February** as temperatures warmed even further. By month's end, all local climate sites (i.e. ASOS stations with a long-standing observational record) reported well above-normal mean temperatures, with most coming in a **whopping 9 to 11 degrees above normal.** (Including: Baker City, Burns, McCall, Boise, Ontario, Jerome, and Twin Falls.) Daily high temperature records were set at the Boise Airport, with February 2015 being the warmest since 1940 (when observations started at the that location). By mid-month, the persistent upper level ridge had gained significant amplitude—cutting off moisture supplies and limiting any additional precipitation gains.

So, winter came in like a lion, but quickly evolved into a late December-February lamb; marked by **very warm temperatures, high snow levels and a suffering winter snowpack.**

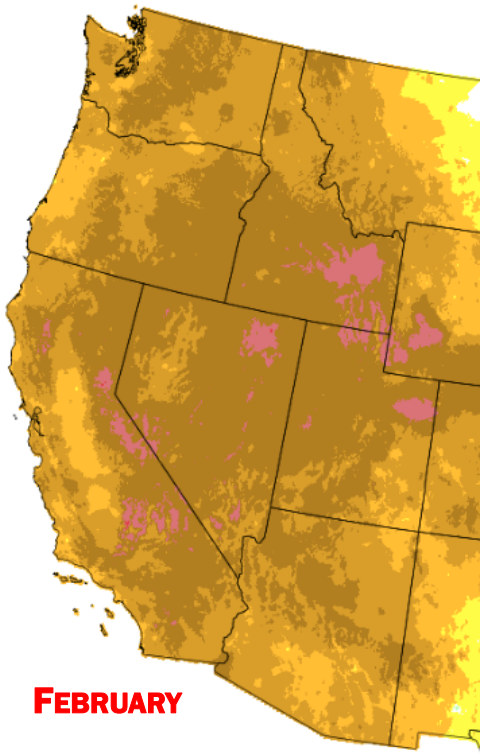


Fig. 1 — February's mean monthly temperature anomaly; denoted as °F above climatological normal.

SEASONAL REVIEW: SPRING 2015

The regional warm spell continued in **March**. Cool conditions early in the month were quickly edged out by a warmer air mass — a large, nearly stationary upper level ridge over the Pacific Northwest. The ridge remained essentially stagnant through the end of the month, forcing incoming systems to both our north and south. Precipitation totals lagged, with some portions of the forecast area receiving less than twenty percent of their monthly average. (As seen in Figure 2, at right.)

April was similarly dry, with the bulk of eastern Oregon and southwest Idaho receiving less than seventy percent of their monthly average. Boise reported half their typical April precipitation, while the Magic Valley received less than one-quarter of their average. Across the whole forecast area, only the southern third of the Vale BLM managed to approach normal. Mountain snowack, which typically peaks at the beginning of April, was near or below 25% of normal. (Figure 3, at right.) Many SNOTEL locations hit record low snow-water equivalent (SWE). Temperatures averaged near to slightly above-normal in this time frame.

The weather pattern became more active in **May**, as a deep upper level trough migrated southeast from the Gulf of Alaska; deepening and setting up shop over the West for nearly three weeks. The moist, unstable air mass caused more changeable temperatures and provided intermittent rounds of convective showers, helping boost May's precipitation back toward normal values. This resurgence in precipitation did little for drought recovery, however, and the regional mountain snowpack melted off 4 to 6 weeks ahead of normal.

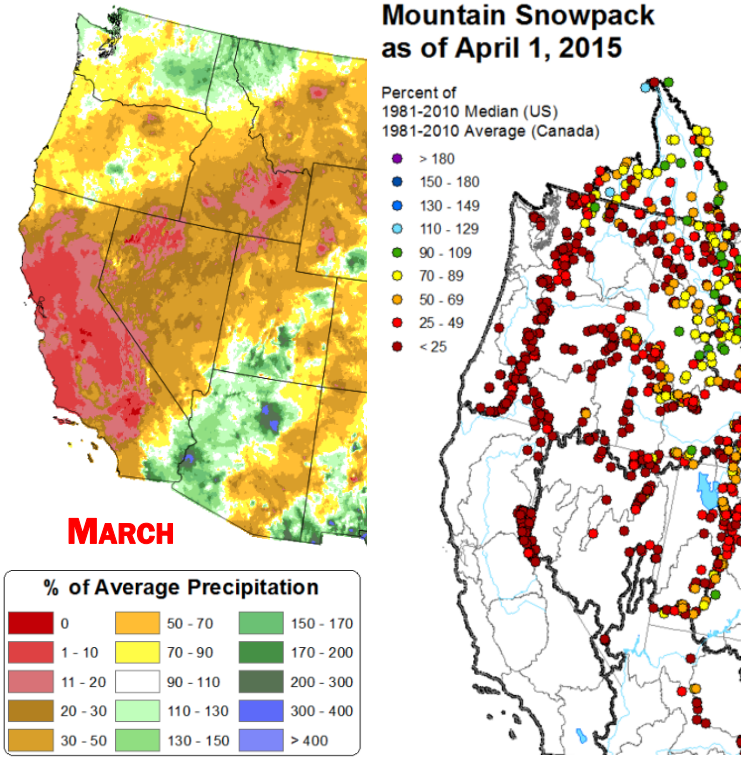


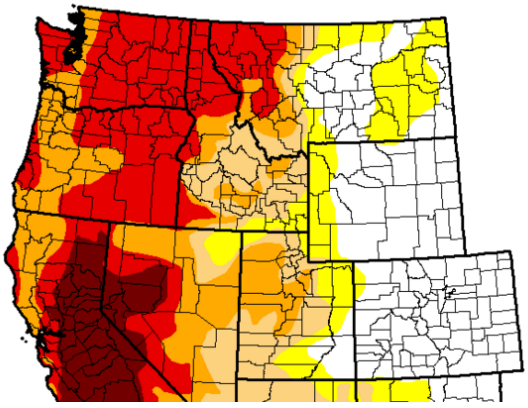
Fig. 2 (L) - Percent of average precipitation across the western U.S. for March. **Fig. 3 (R)** — Mountain snowpack as a percent of average (1981-2010) as of April 1, 2015.

SEASONAL REVIEW: SUMMER 2015

Record-breaking warmth continued in **June.** All climate sites averaged between 6° and 10.5° degrees above the monthly normal. Boise had its warmest June ever, with records dating back to 1869. Dry westerly flow aloft dominated the region from the 5th through the 25th, producing little-to-no precipitation. A pattern shift occurred on the 26th, as a strong upper level ridge amplified over the Great Basin. The anomalously strong ridge spurred record-breaking, triple-digit temperatures and supported the northward transport of the monsoon moisture. What little precipitation occurred fell via convection this last week of the month. It wasn't enough to cover the earlier deficit, however, and all sites reported well below-normal precipitation yet again.

July was more changeable overall. The upper level ridge from June held on through the 4th of July, but fell victim to an incoming Pacific trough on the 5th. Intermittent troughs coupled with monsoon moisture; cooling temperatures back to normal and boosting precipitation to above-normal values near and north of the Nevada border.

August was neither as stagnant as June, nor as changeable as July. High pressure dominated much of the month, but proved weaker (and more susceptible to passing upper level troughs) than the upper level ridging seen earlier in the summer. Southcentral Idaho faired the best precipitation-wise, but drought conditions worsened across eastern Oregon. By month's end, the bulk of the Pacific Northwest was listed as being in "extreme drought"; including all of eastern Oregon, and Adams, Washington, and Owyhee counties of Idaho. (Figure 4, below.)



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	25.90	74.10	59.37	42.52	27.60	7.62
Last Week 8/18/2015	26.53	73.47	58.91	42.01	23.69	7.62
3 Months Ago 5/26/2015	25.37	74.63	57.03	35.92	17.59	7.94
Start of Calendar Year 12/30/2014	34.76	65.24	54.48	33.50	18.68	5.40
Start of Water Year 9/30/2014	31.48	68.52	55.57	35.65	19.95	8.90
One Year Ago 8/26/2014	27.50	72.50	58.91	41.45	20.62	8.90

Intensity:

D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Fig. 4 — Drought conditions across the West as of August 25, 2015. Much of the Pacific Northwest was in "extreme drought," while "exceptional drought" persisted across California and western Nevada.

SEASONAL REVIEW: FALL 2015

An active and unsettled weather pattern brought *minor* relief to local drought conditions, with most of eastern Oregon and western Idaho receiving near or above normal precipitation in **September**. Temperature fluctuations averaged to near-normal by month's end. Passing fronts spurred thunderstorms, triggering additional fire starts.

Despite ongoing smoke from local fires hindering afternoon sunshine, the return of high pressure aloft produced yet another month of above-normal temperatures. For Boise, **October** was the eleventh (eleventh!) month in a row that rang in above-normal. Three separate rounds of light precipitation brought rainfall amounts to above-normal values across much of the area. Burns BLM and the Baker Valley were the exceptions, with precipitation amounts at or below the monthly normal.

November marked a welcomed transition to cooler, wetter weather. It was also the first month of the year with across-the-board *below-normal* temperatures. After three weeks of fall-like weather, an upper level trough moved southeast from the British Columbia coastline, bringing the first significant round of snowfall for lower elevations. Arctic air then filtered in behind the storm (from British Columbia and western Montana), causing a shallow temperature inversion. Higher elevations saw a slow increase in temperatures, but lower valleys were entrenched in cold air.

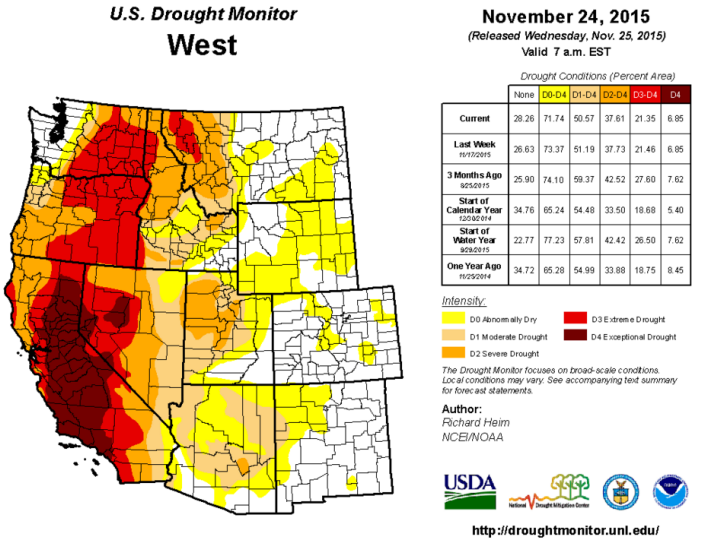


Fig. 5 — Regional drought conditions as of November 24, 2015.

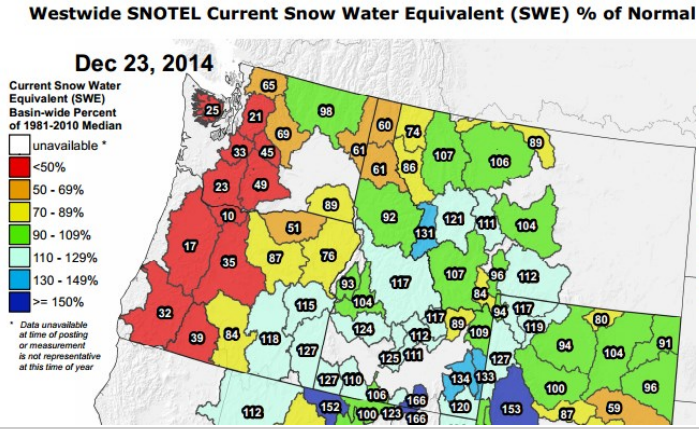
Improvement in regional drought conditions can be seen in Figure 5 (above), especially west of the Cascades and across north and central Idaho.

STATUS OF THE SNOWPACK

The anomalously warm conditions of winter 2014-2015 caused significant snowpack deficits. A snapshot of last year's mid-winter snowpack can be seen in Figure 6 below. Local snowpack was on track through December 2014, but dropped significantly during the warm, dry months of January and February. Note last year's snowpack throughout the Cascades, where late-December deficits were severe.

Despite strong El Nino conditions (as represented by above-normal sea-surface temperatures in the equatorial Pacific), the upper level storm track has, thus far, been favorable for the Pacific Northwest. Both November and December 2015 have been active and unsettled with several significant snowfall events—even at lower elevations. The Cascades have benefited as well, with enough snowfall to boost their percentages back to above-normal values. (As seen in Figure 7, below.) Typically, the presence of an El Nino means drier conditions for the Pacific Northwest, but the current El Nino is, by no means, typical.

There have been only three recorded El Nino events of similar strength since 1950, when sea-surface temperature measurements became increasingly reliable. (The winters of 1972-1973, 1982-1983, and 1997-1998.) El Nino's impacts on the upcoming January and February snowpack is of utmost interest, and remains to be seen.



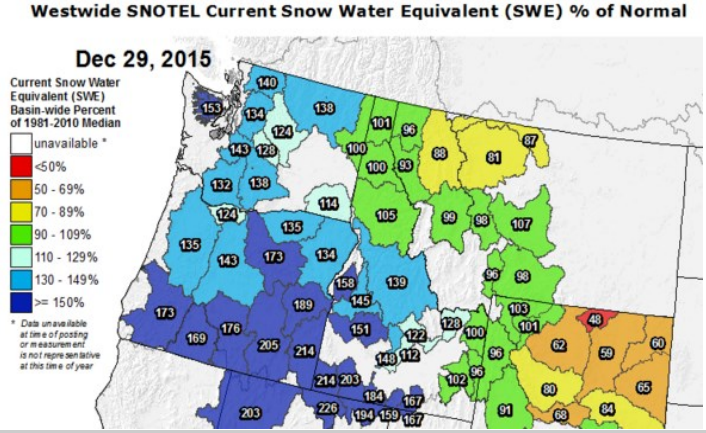
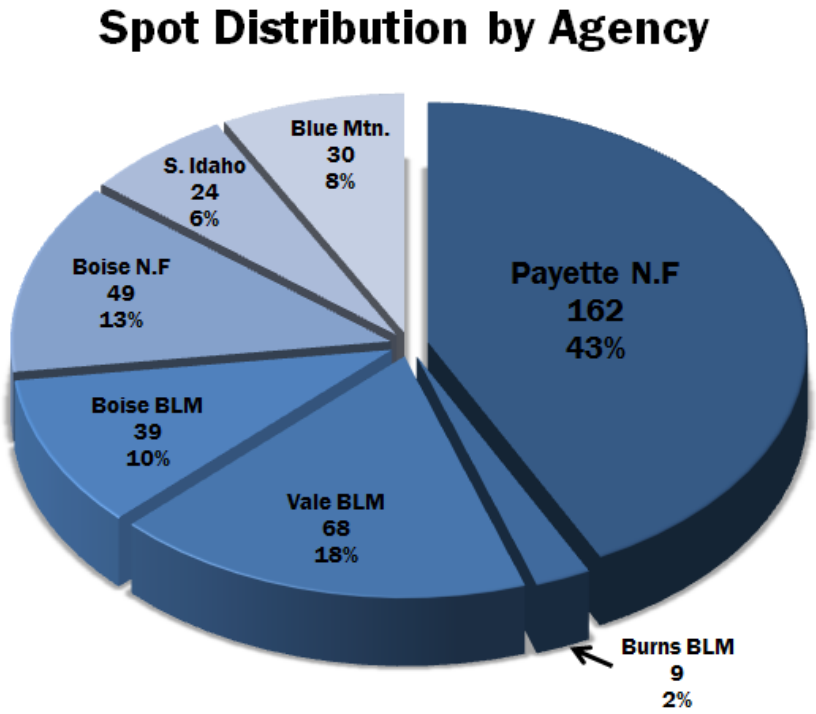


Fig. 6 (L) & Fig. 7 (R) — Basin-Wide Snow Water Equivalent (SWE) Percent of Normal for December 2014 (L) and December 2015 (R), respectively.

SPOT FORECASTS

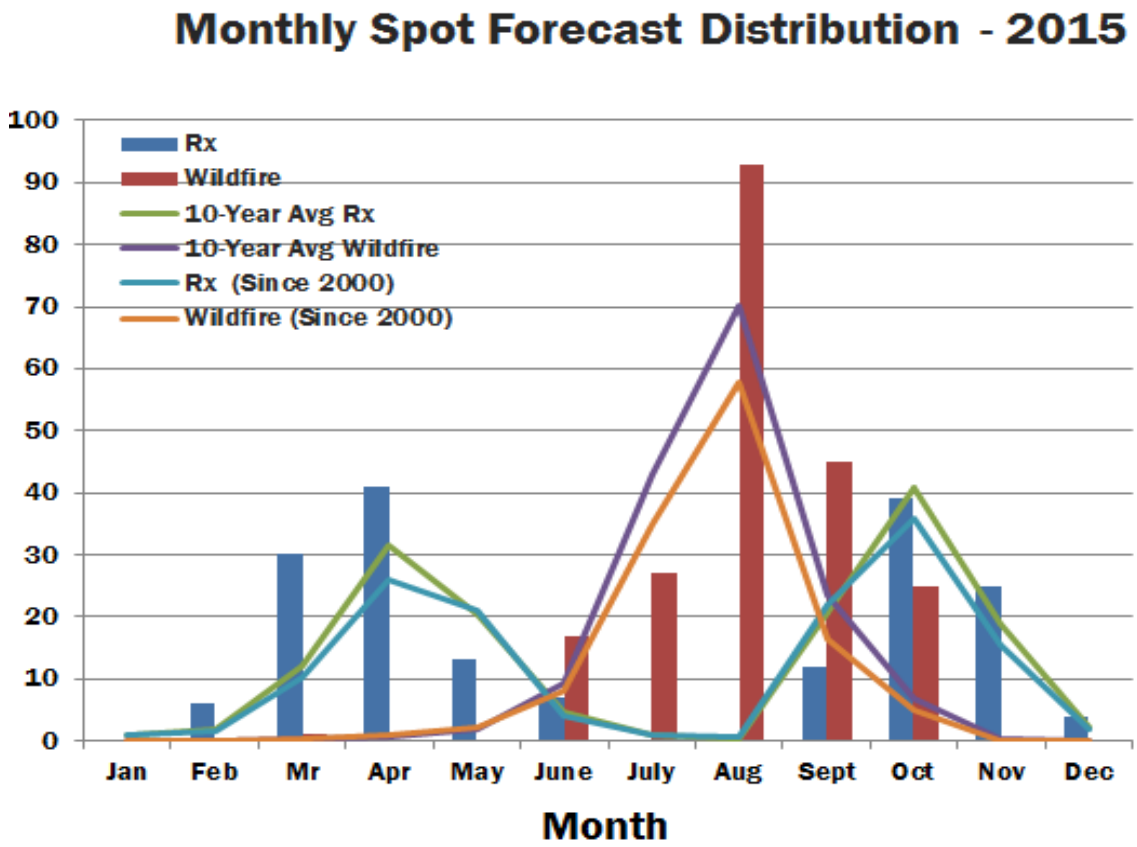


NWS-Boise issued 385 spot forecasts this year, an increase from 2014's 345. Of these 385 spots, 177 were from prescribed burns and 208 were from wildfires.

As seen in Fig. 9 below, we received the greatest number of spot requests in the month August, peaking well above the monthly average in both the "10-year" and "Since 2000" comparisons .

Spot frequency was also evaluated by requesting agency (Fig. 8), with the Payette National Forest keeping us in business *yet again* this year.

At Left: Fig. 8—20145NWS-Boise spot forecast distribution, broken down by requesting agency.



Above: Fig. 9— Monthly spot forecast distribution; broken into spots for prescribed burns and spots for wildfires, then compared to historical monthly values for each category. Historical references are "10-Year Average" and "Since 2000."

Red Flag Warnings

NWS-Boise issues Red Flag Warnings for imminent or already occurring severe fire weather, including scattered thunderstorms (for potential lightning), extremely low humidity in conjunction with strong winds, and Haines 6 conditions (across the Boise and Payette National Forests and Baker Valley of Oregon).

In 2015, NWS-Boise issued 57 Red Flag Warnings (RFWs), an increase from 2014's 39 warnings, but still down considerably from 2013's issuance of 80 warnings. Of this year's 57 warnings, 30 verified. The remaining 27 signify times when an RFW had been issued, but weather conditions didn't quite meet local RFW criteria, i.e. warnings that didn't verify.

There was only one "missed event'; a situation when severe fire weather conditions materialized, but no RFW had been issued.

Statistically speaking, these numbers work out to a 'probability of detection' or POD of 0.97 and a 'false alarm ratio' or FAR of 0.47. (In a perfect scenario, our POD would be 1—implying we detected all severe fire weather events and missed none. The higher the FAR, the more we have "cried wolf", i.e. issued warnings when conditions didn't materialize. Ideally, we'd like a FAR closer to zero.) This year's POD statistic is an improvement over 2014, while our FAR still needs significant work.

"But who wants to be foretold the weather? It is bad enough when it comes, without having the misery of knowing about it beforehand."

- Jerome K. Jerome , *Three Men in a Boat*

Cornet–Windy Ridge Fire
August 2015
Photo Credit: Chuck Redman

IMET Support & Dispatches

Local Incidents	IMET Assigned	Dates
Bendire Complex Near Juntura, OR	Jeff Colton—Grand Junction WFO	8/16-8/21
Cornet-Windy Ridge Near Baker City, OR	Chuck Redman—Boise WFO Gary Zell—Tucson WFO	8/13-8/23 8/19-8/23
Cougar Near Cascade, ID	Megan Thimmesch-Boise WFO	8/17-8/25
Dry Gulch Near Halfway, OR	Megan Thimmesch-Boise WFO	9/14-9/18
Eagle Complex Near Richland, OR	John Quagliariello–Wilmington WFO Gary Zell-Tucson WFO Shad Keene-Medford WFO	8/16-8/28 8/24-8/28 8/29-8/31
Rapid/West Scriver Near Smith's Ferry/Lake Fork, ID	Robert Hoenisch-Great Falls WFO	8/14-8/31
Soda Near Jordan Valley, OR	Megan Thimmesch-Boise WFO Kurt Van Spoeybroeck-Central Region HQ	8/12-8/17 8/14-8/18
Teepee Springs Near Riggins, ID	Mark Loeffelbein—Western Region HQ Joe Goudsward-Little Rock HQ Jack Messick-Pocatello WFO	8/14-9/02 9/02-9/11 9/10--9/16
Walker Near Idaho City, ID	Chuck Redman-Boise WFO Larry Van Bussum-NWS HQ	10/13-10/15 10/15-10/18

Incident	Dispatches by Local IMETs	Dates
Phillips Creek Near Elgin, OR	Chuck Redman-Boise WFO	8/4—8/12
Soda Near Jordan Valley, OR	Megan Thimmesch-Boise WFO	8/12-8/17
Cornet-Windy Ridge Near Baker City, OR	Chuck Redman-Boise WFO	8/13-8/23
Cougar Near Cascade, ID	Megan Thimmesch-Boise WFO	8/17-8/25
North Star Near Omak, WA	Chuck Redman-Boise WFO	8/29-9/9
Dry Gulch Near Halfway, OR	Megan Thimmesch-Boise WFO	9/14-9/18
Walker Near Idaho City, ID	Chuck Redman-Boise WFO	10/13-10/15

Training & Teaching Assignments

Chuck Redman

Taught:

February 2015	S290: Intermediate Wildland Fire Behavior	Ontario, OR
March 2015	NWS IMET Virtual Workshop (CEE)	Boise, ID
April 2015	Burn Boss Refresher— Boise N.F.	Boise, ID
April 2015	NWS IMET Workshop (CEE)	Boise, ID
May 2015	S290: Intermediate Wildland Fire Behavior	McCall, ID
May 2015	Smokejumper Seasonal Outlook	Boise, ID
June 2015	Lookout Refresher—Boise N.F.	Boise, ID
June 2015	S190: Basic Wildland Fire Behavior	Fairfield, ID
June 2015	S290: Intermediate Wildland Fire Behavior	Vale, OR

Attended:

March 2015	NWS IMET Virtual Workshop (CEE)	Boise, ID
April 2015	RT130: Safety Refresher	Boise, ID

Megan Thimmesch

Taught:

February 2015	RX410: Smoke Management Techniques	Boise, ID
February 2015	S390: Intro. to Wildland Fire Behavior Calc.	Boise, ID
April 2015	NWS IMET Workshop (CEE)	Boise, ID
April 2015	M410: Facilitative Instructor	Boise, ID
May 2015	S290: Intermediate Wildland Fire Behavior	Boise, ID
May 2015	Weather Refresher — Price Valley Heli-Rappel	Price Valley, ID
June 2015	Lookout Refesher – Payette N.F.	New Meadows, ID
June 2015	S290: Intermediate Wildland Fire Behavior	Vale, OR
November 2015	S390: Intro. to Wildland Fire Behavior Calc.	Boise, ID
November 2015	M410: Facilitative Instructor	Boise, ID

Attended:

March 2015	Weather Information Management System (NWIMS)	Boise, ID
March 2015	NWS IMET Virtual Workshop (CEE)	Boise, ID
April 2015	RT130: Safety Refresher	Boise, ID

Contact Us!

Complaints? Call:

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